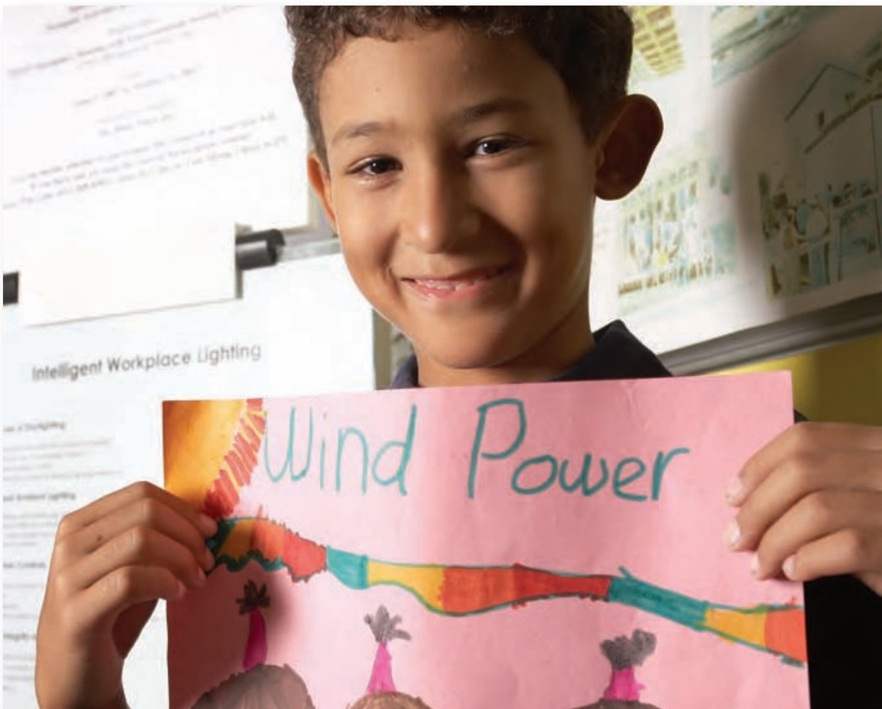
The Energy Answer May Be Blowing in the Wind

By Donald E. Bowen Jr., PLS



Facing diminishing budgets and increased operating costs, districts across the country must make some very difficult choices. Some districts are even at the point of having to close schools.

One strategy that might help schools reduce operating costs and allow administrators to redirect those savings to salaries, facilities, and curricula is wind power. Wind power is a clean, renewable option to stabilize or reduce energy costs and is currently hard at work at many public and private institutions. However, it's not something that districts can implement quickly. A wind project may require one to three years of preliminary research and planning before construction.

First, officials must complete a feasibility study to determine whether the project has potential merit and to assess the quality of the existing wind resource. The feasibility study analyzes topographical and wind resource data, in conjunction with existing and future energy cost estimates, to determine a project's preliminary technical and economic merit.

With favorable initial results, data are collected for 9–12 months to verify the consistency of wind speeds at various altitudes across the range of seasons. Once wind data have been collected and assessed, the feasibility study evaluates and corrects possible environmental, political, and engineering concerns. The study also outlines the permitting and zoning requirements necessary to achieve federal, state, and local approvals.

The design, engineering, and construction phases of the project are implemented once the feasibility study has determined that the project has adequate merit.

The Power of the Wind

The Town of Ipswich, Massachusetts, faced $350,000–$400,000 in annual electricity costs for its buildings and offices. Saving all or part of these costs would make funds available for additional teacher salaries, school supplies, and community programs. Accordingly, a partnership developed between the public school and municipal light department to conceive and implement a wind turbine project that would reduce the economic energy burden on the town by providing the school system with 37.7% of its electricity needs.

The financial benefits to the municipal light department over 20 years include savings of $500,000 (after paying back a $2.4 million loan at 5% interest) and $1.5 million generated from the sale of Renewable Energy Credits. The school will realize $2.5 million in savings over 20 years (including payback of $1.6 million in 0% interest Clean Renewable Energy Bonds) and $900,000 from the sale of Renewable Energy Credits.

In addition, the wind turbine project provides educational opportunities for students, including a local lab for studying engineering and environmental and physical sciences. "I see this as a tremendous opportunity for the town and schools to really collaborate and cooperate on a common concern—that is, energy usage and our reliance on fossil fuels. And what a great way to begin to reduce that reliance," Rick Korb, superintendent of schools and a member of the subcommittee working on the turbine project, told the *Boston Globe* in March 2008. "It will also be a great educational tool for the kids of Ipswich and the community. It's really what I like to call a win-wind" (Rattigan 2008).

The Town of Portsmouth, Rhode Island, installed an AAER 1.5-megawatt wind turbine generator at the high school. The turbine generator supplies much of the electrical power needs of the school and at times generates additional electrical power, which is sold to National Grid for 15.4 cents for every kilowatt-hour generated.

The wind turbine generator is expected to provide more than 3 million kilowatt-hours of power annually and to generate a yearly savings of more than $100,000. Over the expected 20-year minimum lifetime of the turbine, the projected net savings are nearly $3 million. According to Finance Director David P. Faucher, the turbine is expected to cover one-quarter of its $433,000 electric bill, pay the annual $238,643 installment on bonds used for its construction, and generate an additional $238,000 in revenue to offset municipal government or school expenses (Macris 2009).

Finding Funding

Grants from the federal and state governments are designed to promote the adoption of renewable energy and to offset preconstruction technical support and capital costs. At the federal level, the Clean Renewable Energy Bonds program creates attractive financing options for both borrowers and lenders.

A qualified buyer is given access to 0% interest bonds (a formal contract to repay borrowed money at no interest for a fixed period) for projects that generate electricity from clean or renewable sources. The lender will receive a tax credit from the federal government instead of an interest check from the borrower. In addition, Treasury Department grants are now available in lieu of tax credits with wind projects eligible to receive grant funding for up to 30% of the basis for a property's value.

At the state level, funding mechanisms vary. For example, Massachusetts funding is available for public facilities that are customers of investor-owned electric distribution utilities or municipal light plant departments that pay into the Renewable Energy Trust.

The Community Wind program provides financial and technical support to wind projects through three different stages of development: (a) services for high-level site screening (public projects only), (b) grant support for in-depth technical and economic feasibility analysis, and (c) grants for design and construction support. Under these programs, wind projects starting at 100 kilowatts, up to and beyond 600 kilowatts, are eligible to receive from $30,000 for a basic feasibility study up to $85,000 for a feasibility study that includes the installation and operation of a meteorological tower to collect on-site wind data.

For design and construction, public entities are eligible for a zero-cost share incurred below the maximum funding level, while private organizations are responsible for 25% of the cost share. Funds available for systems starting at 100 kilowatts, up to and beyond 600 kilowatts, range from $225,000 to $600,000 (Massachusetts Technology Collaborative 2009).

Iowa, which generates the second-largest amount of wind power in the United States through its Iowa Energy Bank, provides loans and alternative financing options repaid by the energy savings resulting from energy improvement projects. Financing is available via a prearranged, low-interest capital loan note or lease-purchase agreement with a local or regional investment bank. To date, most of Iowa's school districts have participated, as have dozens of hospitals and private colleges.

Likewise, California provides assistance through the Self-Generation Incentive Program and offers incentives to customers who produce electricity with wind turbines with incentive payments ranging from $1.00 per watt to $4.50 per watt. Projects that use systems manufactured in California are eligible for an additional incentive worth 20% of the base incentive. For feasibility studies, the California Energy Commission will provide up to $26 million in loans to schools, hospitals, and local governments for the installation of energy-saving measures and studies (DSIRE 2009).

Running with the Wind

In this challenging financial period, organizations must adapt to preserve the quality of education through teacher positions and material resources in a shifting tide of fiscal and environmental policy. Educators are considering wind power as a solution for many of the economic and environmental challenges they face.

In addition to being a renewable source of energy, wind power presents a new form of economic development, tangible environmental responsibility, and long-term educational benefit to the communities that embrace the opportunity.

References

DSIRE (Database of State Incentives for Renewables and Efficiencies). 2009. California: Incentives/policies for renewables and efficiency. www.dsireusa.org/incentives/index.cfm?re=1&ee=1&spv=0&st=0&srp=1&state=CA (accessed October 8, 2009).

Macris, G. 2009. Portsmouth windmill paying dividends even before it's dedicated. *Providence Journal Online*, May 11. www.projo.com/news/content/PORTSMOUTH_WIND_TURBINE_05–11–09_H8EA908_v24.3393190.html (accessed October 8, 2009).

Massachusetts Technology Collaborative. 2009. Commonwealth wind incentive program. www.masstech.org/renewableenergy/commowealth_wind/community_scale.html (accessed October 8, 2009).

Rattigan, D. 2008. Ipswich wind turbine plan will go before voters. *Boston Globe*, March 2.

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